

Response And Amendment

U.S. Application No. 10/723,428

Docket No. MR/02-003

Page 28 of 32

REMARKS

Applicants have amended the disclosure and the claims, and have also submitted formal drawings herewith, to overcome the rejections and objections set forth in the Office Action dated 20 April 2005.

As for the claims, all of the independent claims (i.e., claims 99, 117, 140, 163 and 172) have been amended to more clearly recite the invention. Minor revisions have also been made to certain dependent claims (i.e., claims 139, 162 and 171) to improve clarity and/or to accommodate the changes made to the independent claims. It is believed that the claims overcome the objections and rejections set forth in paragraphs 4-45 of the Office Action.

In reply to the pending §102(b) and §103(a) rejections, Applicants submit that the `479 patent neither teaches nor suggests (i) the head coil of independent claim 99, (ii) the coil of independent claims 117, 140 and 163, and (iii) the neurovascular array recited in independent claim 172. This is because the `479 patent discloses only a conventional quadrature RF coil, one that is capable of being used only with standard MR scanners. Such a coil merely detects the MR signals --or, more accurately, the quadrature (i.e., vertical and horizontal) components thereof-- emitted by the entire sampled region. However, in a multi-element coil designed for use with a parallel-imaging compatible MR system, each coil element detects MR signals not from the entire sampled region but only from the portion of the region that lies within its field of view.

Response And Amendment

U.S. Application No. 10/723,428

Docket No. MR/02-003

Page 29 of 32

More specifically, the Examiner's asserts that the `479 patent discloses "a plurality of partially-overlapped primary resonant substructures...." (See Office Action, p. 5, lines 2-6) In doing so, the Examiner looked at Figure 10 and the corresponding text at col. 7, line 64 through col. 8, line 25. The cited passage and figure, however, disclose only two separate domed birdcage coils 110 and 110, one overlapping the other. Applicants' claims, in contrast, do not recite two birdcage coils that are overlapped but rather a single coil with a plurality of primary resonant substructures that are partially overlapped. In claim 140 as amended, for example, Applicants recite a single coil whose "pair of ... rings" and the "rods electrically interconnecting [those] rings" are configured to produce a "plurality of ... primary resonant substructures about the birdcage-like structure." It further recites that "each [such] primary resonant substructure [includes] two of said rods and a corresponding section of each [ring] interconnecting them such that each [primary resonant substructure] partially overlaps each of its neighboring primary resonant substructures and is capable of receiving magnetic resonance signals from tissue within its field of view." The `479 patent does not teach a single coil having a plurality of primary resonant substructures let alone a single coil in which each such substructure is partially overlapped by a neighboring substructure. And it certainly does not disclosure such

Response And Amendment

U.S. Application No. 10/723,428

Docket No. MR/02-003

Page 30 of 32

a single coil whose primary resonant substructures each receive MR signals from tissue within its field of view.

Although the coil shown in the drawings (and recited in the claims) of the present application may outwardly look like a conventional (linear or quadrature) birdcage coil, it functions very differently. This is because the novel coil is tuned so that it has a plurality of primary resonant substructures, each of which designed to operate as a single coil element that receives MR signals from tissue within its field of view. The conventional birdcage coil disclosed in the '479 patent is not specially adapted for use with a parallel-imaging compatible MR system, as it operates as a single antenna designed to detect MR signals from the entire enclosed region. In Applicants' claims, however, the single coil is designed for use with parallel-imaging compatible MR systems as it is endowed with structural limitations/characteristics (e.g., primary resonant substructures, etc.) that make such use possible.

As for the disclosure and drawings, the objections set forth in paragraphs 1-3 on page 2 of the Office Action have been overcome by this *Response And Amendment* and the formal drawings filed herewith. Specifically, in the disclosure, the following minor revisions have been made. First, paragraph [05] has been revised to add a brief description of the matter denoted by reference numeral 6 in the drawings (i.e., Figures 1A and 1C) as originally filed. This is

Response And Amendment

U.S. Application No. 10/723,428

Docket No. MR/02-003

Page 31 of 32

permitted by M.P.E.P. §2163.06.¹ Second, all appearances of "Figure 2" in the description have been replaced by "Figures 2A-2B." Made in paragraphs [32]-[37], [42], [53], [57]-[61], [64], [75], [76] and [79], these amendments were required by the Examiner because the subject matter originally depicted in Figure 2 in the informal drawings had to be divided into two sheets (i.e., Figures 2A and 2B) to comply with the requirements of 37 C.F.R. §1.84. Accordingly, the two sheets on which Figures 2A and 2B now appear are intended as replacements for the informal, single sheet version (i.e., Figure 2) of the same subject matter. Also, paragraph [67] has been amended to correct a typographical error.

As for the drawings in total, Applicants submit the formal drawings to overcome all outstanding objections set forth by the Examiner. This addresses item 10 on page 1 (i.e., OFFICE ACTION SUMMARY sheet) of the Office Action. These formal drawings, inclusive of Figures 2A-2B above, are therefore submitted as replacements for the informal drawings originally filed with the application. This complete set of formal drawings is intended to replace any and all previous submissions of drawings.

¹ In pertinent part, M.P.E.P. §2163.06 states "... *information contained in any one of the specification, claims or drawings of the application as filed may be added to any other part of the application without introducing new matter.*"

Response And Amendment

U.S. Application No. 10/723,428

Docket No. MR/02-003

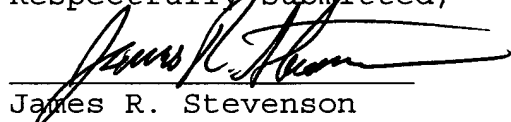
Page 32 of 32

CONCLUSION

Before entry of this *Response And Amendment*, the present application had seventy-five (75) claims total, five (5) of which were independent claims. Upon entry of this *Response And Amendment*, the application contains the same number of claims as seven claims have been amended and none added or canceled. No new matter has been added to the application by virtue of this filing.

Given the foregoing, Applicants respectfully request withdrawal of the objections and rejections set forth in the Office Action of 20 April 2005. Applicants believe the application is ready to be allowed. If the Examiner has any questions about this filing, he is invited to call the undersigned at the number listed below.

Respectfully submitted,



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